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PTO/SB/08a (08-03)

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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1

of 4

Application Number	10/032,284
Filing Date	December 21, 2001
First Named Inventor	Ling Chen, et al.
Group Art Unit	1763
Examiner Name	Moore, Karla A.
Attorney Docket Number	AMAT/5192.02/CPI/COPPER/PJS
Submission Date	February 17, 2004

### U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
ku	A1	US-6660126 B2	12/09/2003	Nguyen, et al.	
	A2	US-6630030 B1	10/07/2003	Suntola, et al.	
	A3	US-6579372 B2	06/17/2003	Park	
	A4	US-6578287 B2	06/17/2003	Aswad	
	A5	US-6572705 B1	06/03/2003	Suntola, et al.	
	A6	US-6551406 B2	04/22/2003	Kilpi	
	A7	US-6511539 B1	01/28/2003	Raaijmakers	
	A8	US-6481945 B1	11/19/2003	Hasper, et al.	
	A9	US-6478872 B1	11/12/2002	Chae, et al.	
	A10	US-6447607 B2	09/10/2002	Soininen, et al.	
	A11	US-6231672 B1	05/15/2001	Choi, et al.	
	A12	US-6197683 B1	03/06/2001	Kang, et al.	
	A13	US-6183563 B1	02/06/2001	Choi, et al.	
	A14	US-5338362	08/16/1994	Imahashi	
	A15	US-5261959	11/16/1993	Gasworth	
	A16	US-20040015300 A1	01/22/2004	Ganguli, et al.	
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	A18	US-20040011504 A1	01/22/2004	Ku, et al.	

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		Number-Kind Code <sup>2</sup> (if known)				
ku	B1	WO 02/45871 A1	06/13/2002	Angstrom Systems, Inc.		
	B2	WO 02/08488 A1	01/31/2002	ASM Microchemistry OY		
	B3	WO 01/36702 A1	05/25/2001	Genitech Co., Ltd.		
	B4	WO 01/17691 A1	03/15/2001	ASM America, Inc.		
	B5	WO 00/79576 A1	12/28/2000	Genitech, Inc.		

Examiner

KARLA MOORE

Date Considered

3/9/05

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Sheet 2

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Application Number	10/032,284
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		Number-Kind Code <sup>2</sup> (if known)			
W	A1	US-20040011404 A1	01/22/2004	Ku, et al.	
	A2	US-20030224107 A1	01/29/1991	Hay et al.	
	A3	US-20030213560 A1	11/20/2003	Wang, et al.	
	A4	US-20030198754 A1	10/23/2003	Xi, et al.	
	A5	US-20030194493 A1	10/16/2003	Chang, et al.	
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	A11	US-20030113187 A1	06/19/2003	Lei, et al.	
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		Number-Kind Code <sup>2</sup> (if known)				
W	B1	WO 00/54320	09/14/2000	Genus, Inc.		
	B2	WO 99/65064	12/16/1999	A.S.M. International N.V.		
	B3	WO 99/01595	01/14/1999	Neste OY		
	B4	WO 98/17107	06/06/1996	Milrokemia OY		
	B5	JP 2000-212752	08/02/2000			

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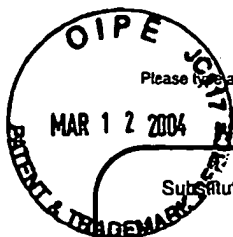
KAPLA MOORE

Date Considered

3/9/05

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		Number-Kind Code <sup>2</sup> (if known)			
✓	A1	US-20030042630 A1	03/06/2003	Babcoke, et al.	
	A2	US-20030023338 A1	01/30/2003	Chin, et al.	
	A3	US-20030010451 A1	01/16/2003	Tzu, et al.	
	A4	US-20030004723 A1	01/02/2003	Chihara	
	A5	US-20020146511 A1	10/10/2002	Chiang, et al.	
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	A9	US-20020121342 A1	09/05/2002	Nguyen, et al.	
	A10	US-20020121241 A1	09/05/2002	Nguyen, et al.	
	A11	US-20020108570 A1	08/15/2002	Lindfors	
	A12	US-20020104481 A1	08/08/2002	Chiang, et al.	
	A13	US-20020094689 A1	07/18/2002	Park	
	A14	US-20020092471 A1	07/18/2002	Kang, et al.	
	A15	US-20020086106 A1	07/04/2002	Park, et al.	
	A16	US-20020076508 A1	06/20/2002	Chiang, et al.	
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	A18	US-20020076481 A1	06/20/2002	Chiang, et al.	

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		Number-Kind Code <sup>2</sup> (if known)				
	B1	EP 1 167 569 A1	01/02/2002	IPS Limited		
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	B3					
	B4					
	B5					

Examiner

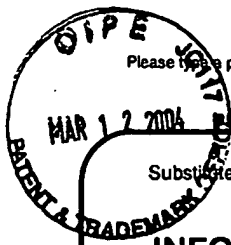
KARLA MOORE

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3/9/05

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Sheet 4

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Application Number	10/032,284
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		Number-Kind Code <sup>2</sup> (if known)			
KAPLA	A1	US-20020073924 A1	06/20/2002	Chiang, et al.	
	A2	US-20020066411 A1	06/06/2002	Chiang, et al.	
	A3	US-20020052097 A1	05/02/2002	Park	
	A4	US-20020041931 A1	04/11/2002	Suntola, et al.	
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	A7	US-20010054377 A1	12/27/2001	Lindfors, et al.	
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↓	A11	US-			
	A12	US-			
	A13	US-			
	A14	US-			
	A15	US-			
	A16	US-			
	A17	US-			
	A18	US-			

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U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified)					Docket No. AMAT/6222		Serial No. 10/032,284	
LIST OF PATENTS AND PUBLICATIONS CITED BY APPLICANT					Applicant Chen, et al.			
(Use several sheets if necessary)					Filing Date December 21, 2001		Group Unknown	
Examiner Unknown								

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U.S. Patent Documents							
*Examiner Initial		Document Number	Issue Date	Applicant(s) Name	Class	Subclass	Filing Date If Appropriate
W	A1	4,058,430	11/15/77	Suntola et al.	156	611	11/25/1975
	A2	4,389,973	06/28/83	Suntola et al.	118	725	12/11/1981
	A3	4,413,022	11/01/83	Suntola et al.	427	255.2	06/21/1979
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	A10	4,838,993	06/13/89	Aoki et al.	156	643	12/03/1987
	A11	4,840,921	06/20/89	Matsumoto	437	89	06/30/1988
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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
W	B1	01/66832 A2	09/13/2001	WO	C30B	16/44	_____	X
	B2	01/40541 A1	06/07/2001	WO	C23C	16/40	_____	X
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	B4	01/29893 A1	04/26/2001	WO	H01L	21/768	_____	X
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OTHER ART		
*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.
W	C1	Hultman, et al., "Review of the thermal and mechanical stability of TiN-based thin films", <i>Zeitschrift Fur Metallkunde</i> , 90(10) (Oct. 1999), pp. 803-813.
W	C2	Klaus, et al., "Atomic Layer Deposition of SiO <sub>2</sub> Using Catalyzed and Uncatalyzed Self-Limiting Surface Reactions", <i>Surface Review &amp; Letters</i> , 6(3&4) (1999), pp. 435-448.
Examiner <u>LAPLA MOORE</u>		Date Considered <u>3/9/00</u>

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Examiner Unknown								

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U.S. Patent Documents							
*Examiner Initial		Document Number	Issue Date	Applicant(s) Name	Class	Subclass	Filing Date if Appropriate
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	A15	4,861,417	08/29/89	Mochizuki et al.	156	610	03/24/1988
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	A18	4,931,132	06/05/90	Aspnes et al.	156	601	10/07/1988
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	A21	4,993,357	02/19/91	Scholz	118	715	12/21/1989
	A22	5,013,683	05/07/91	Petroff et al.	437	110	01/23/1989
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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
✓	B6	01/29280 A1	04/26/2001	WO	C23C	16/32	—	X
	B7	01/27347 A1	04/19/2001	WO	C23C	16/44	—	X
	B8	01/27346 A1	04/19/2001	WO	C23C	16/44	—	X
✓	B9	01/15220 A1	03/01/2001	WO	H01L	21/768	—	X

OTHER ART		
*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.
✓	C3	Yamaguchi, et al., "Atomic-layer chemical-vapor-deposition of silicon dioxide films with extremely low hydrogen content", <i>Appl. Surf. Sci.</i> , Vol. 130-132 (1998), pp. 202-207.
✓	C4	Gorge, et al., "Surface Chemistry for Atomic Layer Growth", <i>J. Phys. Chem.</i> , Vol. 100 (1996), pp. 13121-131.
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(Use several sheets if necessary)					Filing Date December 21, 2001		Group Unknown	
Examiner Unknown								

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*Examiner Initial		Document Number	Issue Date	Applicant(s) Name	Class	Subclass	Filing Date If Appropriate
W	A28	5,225,366	07/06/93	Yoder	437	108	06/22/1990
	A29	5,246,536	09/21/93	Nishizawa et al.	156	610	03/10/1989
	A30	5,250,148	10/05/93	Nishizawa et al.	156	611	11/12/1991
	A31	5,254,207	10/19/93	Nishizawa et al.	156	601	11/30/1992
	A32	5,256,244	10/26/93	Ackerman	156	613	02/10/1992
	A33	5,270,247	12/14/93	Sakuma et al.	437	133	07/08/1992
	A34	5,278,435	01/11/94	Van Hove et al.	257	184	06/08/1992
	A35	5,281,274	01/25/94	Yoder	118	697	02/04/1993
	A36	5,290,748	03/01/94	Knuuttila et al.	502	228	07/16/1992
	A37	5,294,286	03/15/94	Nishizawa et al.	156	610	01/12/1993
	A38	5,296,403	03/22/94	Nishizawa et al.	437	133	10/23/1992
	A39	5,300,186	04/05/94	Kitahara et al.	156	613	04/07/1992
✓	A40	5,311,055	05/10/94	Goodman et al.	257	593	11/22/1991

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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
W	B10	00/79576 A1	12/28/2000	WO	H01L	21/205	—	X
	B11	00/79019 A1	12/28/2000	WO	C23C	16/00	—	X
✓	B12	00/63957 A1	10/26/2000	WO	H01L	21/205	—	X

OTHER ART	
*Examiner Initial	Including Author, Title, Date, Pertinent Pages, Etc.
W	C5 George, et al., "Atomic layer controlled deposition of SiO <sub>2</sub> and Al <sub>2</sub> O <sub>3</sub> using ABAB...binary reaction sequence chemistry", <i>Appl. Surf. Sci.</i> , Vol. 82/83 (1994), pp. 460-467.
W	C6 Wise, et al., "Diethyldiethoxysilane as a new precursor for SiO <sub>2</sub> growth on silicon", <i>Mat. Res. Soc. Symp. Proc.</i> , Vol. 334 (1994), pp. 37-43.
Examiner	DATE MOORE
	Date Considered 3/9/02

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W	A41	5,316,615	05/31/94	Copel	117	95	03/09/1993	
	A42	5,316,793	05/31/94	Wallace et al.	427	248.1	07/27/1992	
	A43	5,330,610	07/19/94	Eres et al.	117	86	05/28/1993	
	A44	5,336,324	08/09/94	Stall et al.	118	719	12/04/1991	
	A45	5,338,389	08/16/94	Nishizawa et al.	117	89	04/21/1993	
	A46	5,348,911	09/20/94	Jurgensen et al.	117	91	04/26/1993	
	A47	5,374,570	12/20/94	Nasu et al.	437	40	08/19/1993	
	A48	5,395,791	03/07/95	Cheng et al.	437	105	10/20/1993	
	A49	5,438,952	08/08/1995	Otsuka	117	84	01/31/1994	
	A50	5,439,876	08/08/95	Graf et al.	505	447	08/16/1993	
	A51	5,441,703	08/15/95	Jurgensen	422	129	03/29/1994	
	A52	5,443,033	08/22/95	Nishizawa et al.	117	86	03/11/1994	
	A53	5,443,647	08/22/95	Aucoin et al.	118	723 ME	07/11/1994	
✓	A54	5,455,072	10/03/95	Bension et al.	427	255.7	11/18/1992	

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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
W	B13	00/54320 A1	09/14/2000	WO	H01L	21/44	—	X
	B14	00/16377 A2	03/23/2000	WO	H01L	---	—	X
	B15	00/15881 A2	03/23/2000	WO	C30B	---	—	X
✓	B16	00/15865 A1	03/23/2000	WO	C23C	16/00	—	X

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W	C7	Niinisto, et al., "Synthesis of oxide thin films and overlayers by atomic layer epitaxy for advanced applications", <i>Mat. Sci. &amp; Eng.</i> , Vol. B41 (1996), pp. 23-29.
Examiner	Date Considered	
	3/9/05	

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W	A55	5,458,084	10/17/95	Thorne et al.	117	89	12/09/1993
	A56	5,469,806	11/28/95	Mochizuki et al.	117	97	08/20/1993
	A57	5,480,818	01/02/96	Matsumoto et al.	437	40	02/09/1993
	A58	5,483,919	01/16/96	Yokoyama et al.	117	89	08/17/1994
	A59	5,484,664	01/16/96	Kitahara et al.	428	641	01/21/1994
	A60	5,503,875	04/02/96	Imai et al.	427	255.3	03/17/1994
	A61	5,521,126	05/28/96	Okamura et al.	437	235	06/22/1994
	A62	5,527,733	06/18/96	Nishizawa et al.	437	160	02/18/1994
	A63	5,532,511	07/02/96	Nishizawa et al.	257	627	03/23/1995
	A64	5,540,783	07/30/96	Eres et al.	118	725	05/26/1994
	A65	5,601,651	02/11/97	Watabe	118	715	12/14/1994
	A66	5,616,181	04/01/97	Yamamoto et al.	118	723 ER	11/21/1995
W	A67	5,637,530	06/10/97	Gaines et al.	114	105	06/10/1996

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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
W	B17	99/41423 A2	08/19/1999	WO	C23C	---	---	X
	B18	99/29924 A1	06/17/1999	WO	C23C	16/04	---	X
	B19	99/01595	01/14/1999	WO	C30B	25/14	---	X
W	B20	96/18756 A1	06/20/1996	WO	C23C	16/08	---	X

OTHER ART		
*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.
W	C8	Ritala, et al., "Perfectly conformal TiN and Al <sub>2</sub> O <sub>3</sub> films deposited by atomic layer deposition", <i>Chemical Vapor Deposition</i> , Vol. 5(1) (January 1999), pp. 7-9.
W	C9	Klaus, et al., "Atomically controlled growth of tungsten and tungsten nitride using sequential surface reactions", <i>Appl. Surf. Sci.</i> , Vol 162-163 (2000), pp. 479-491.
Examiner	KAPLA MOORE	
Date Considered	3/9/05	

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U.S. Patent Documents							
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✓	A68	5,641,984	06/24/97	Aftergut et al.	257	433	08/19/1994
↓	A69	5,644,128	07/01/97	Wollnik et al.	250	251	08/25/1994
↓	A70	5,693,139	12/02/97	Nishizawa et al.	117	89	06/15/1993
↓	A71	5,705,224	01/06/98	Murota et al.	427	248.1	01/31/1995
↓	A72	5,707,880	01/13/98	Aftergut et al.	437	3	01/17/1997
↓	A73	5,711,811	01/27/98	Suntola et al.	118	711	11/28/1995
↓	A74	5,730,802	03/24/98	Ishizumi et al.	118	719	12/27/1996
↓	A75	5,747,113	05/05/98	Tsai	427	255.5	07/29/1996
↓	A76	5,749,974	05/12/98	Habuka et al.	118	725	07/13/1995
↓	A77	5,796,116	08/18/98	Nakata et al.	257	66	07/25/1995
↓	A78	5,807,792	09/15/98	Ilg et al.	438	758	12/18/1996
↓	A79	5,830,270	11/03/98	McKee et al.	117	106	08/05/1996
↓	A80	5,835,677	11/10/98	Li et al.	392	401	10/03/1996

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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
✓	B21	96/17107 A1	06/06/1996	WO	C23C	16/44	—	X
↓	B22	93/02111 A1	02/04/1993	WO	C08F	4/78	—	X
↓	B23	91/10510 A1	07/25/1991	WO	B01J	37/02	—	X
↓	B24	0 799 641 A2	10/08/1997	EP	B01J	20/32	—	X

OTHER ART		
*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.
✓	C10	Min, et al., "Atomic layer deposition of TiN thin films by sequential introduction of Ti precursor and NH/sub3", <i>Symp.: Advanced Interconnects and Contact Materials and Processes for Future Integrated Circuits</i> (Apr. 13-16, 1998), pp. 337-342.
Examiner	KAPLA MOORE	
Date Considered	3/9/05	

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ku	A81	5,851,849	12/22/98	Comizzoli et al.	438	38	05/22/1997
	A82	5,855,675	01/05/99	Doering et al.	118	719	03/03/1997
	A83	5,855,680	01/05/99	Soininen et al.	118	719	11/28/1995
	A84	5,858,102	01/12/99	Tsai	118	719	02/14/1998
	A85	5,879,459	03/09/99	Gadgil et al.	118	715	08/29/1997
	A86	5,904,565	05/18/1999	Nguyen, et al.	438	687	07/17/1997
	A87	5,916,365	06/29/99	Sherman	117	92	08/16/1996
	A88	5,923,056	07/13/99	Lee et al.	257	192	03/12/1998
	A89	5,923,985	07/13/99	Aoki et al.	438	301	01/14/1997
	A90	5,925,574	07/20/99	Aoki et al.	437	31	04/10/1992
	A91	5,942,040	08/24/99	Kim et al.	118	726	08/27/1997
	A92	5,947,710	09/07/1999	Cooper, et al.	418	63	06/16/1997
	A93	5,972,430	10/26/99	DiMeo, Jr. et al.	427	255.32	11/26/1997

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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
ku	B25	0 442 490 A1	08/21/1991	EP	C30B	25/02	—	X
	B26	0 344 352 A1	12/06/1989	EP	H01L	39/24	—	X
	B27	62-091495 A	04/25/1987	JP	C30B	25/02	—	X

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ku	C11 Klaus, et al., "Atomic Layer Deposition of Tungsten using Sequential Surface Chemistry with a Sacrificial Stripping Reaction," Thin Solid Films 360 (2000), Pages 145 – 153, (Accepted Nov. 16, 1999).
ku	C12 Min, et al., "Metal-Organic Atomic-Layer Deposition of Titanium-Silicon-Nitride Films", Applied Physics Letters, American Inst. Of Physics, Vol 75(11) (Sept. 13, 1999).
Examiner	KAPLA MOORE
Date Considered	3/9/05

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ku	A94	6,001,669	12/14/99	Gaines et al.	438	102	07/21/1992
	A95	6,015,590	01/18/00	Suntola et al.	427	255.23	11/28/1995
	A96	6,025,627	02/15/00	Forbes et al.	257	321	05/29/1998
	A97	6,036,773	03/14/00	Wang et al.	117	97	03/27/1997
	A98	6,042,652	03/28/00	Hyun et al.	118	719	09/07/1999
	A99	6,043,177	03/28/00	Falconer et al.	502	4	01/21/1997
	A100	6,124,158	09/26/00	Dautartas et al.	438	216	06/08/1999
	A101	6,113,977	09/05/00	Soininen et al.	427	64	09/11/1997
	A102	6,130,147	10/10/00	Major et al.	438	604	03/18/1997
	A103	6,139,700	10/31/00	Kang et al.	204	192.17	09/30/1998
	A104	6,174,377	01/16/2001	Doering, et al.	118	729	01/04/1999
↓	A105	6,174,809	01/16/2001	Kang, et al.	438	682	12/15/1998

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							YES	NO
ku	B28	60-065712 A	04/15/1985	JP	C01B	33/113	—	X
	B29	03-048421	03/01/1991	JP	H01L	21/302	—	X
↓	B30	03-286531	12/17/1991	JP	H01L	21/316	—	X

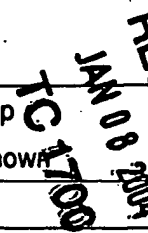
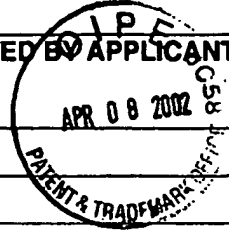
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*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.
ku	C13	Martensson, et al., "Atomic Layer Epitaxy of Copper on Tantalum", <i>Chemical Vapor Deposition</i> , 3(1) (Feb. 1, 1997), pp. 45-50.
	C14	Ritala, et al. "Atomic Layer Epitaxy Growth of TiN Thin Films", <i>J. Electrochem. Soc.</i> , 142(8) (Aug. 1995), pp. 2731-737.
↓	C15	Elers, et al., "NbC15 as a precursor in atomic layer epitaxy", <i>Appl. Surf. Sci.</i> , Vol. 82/83 (1994), pp. 468-474.

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u	A106	6,200,893	03/13/2001	Sneh	438	685	03/11/1998	
	A107	6,203,613	03/20/2001	Gates, et al.	117	104	10/19/1999	
	A108	6,207,302	03/27/2001	Sugiura, et al.	428	690	03/02/1998	
	A109	6,248,605	06/19/2001	Harkonen, et al.	438	29	06/02/1999	
	A110	6,270,572	08/07/2001	Kim, et al.	117	93	08/09/1999	
	A111	6,287,965	09/11/2001	Kang, et al.	438	648	02/23/2000	
	A112	6,291,876	09/18/2001	Stumborg, et al.	257	632	08/20/1998	
	A113	6,305,314	10/23/2001	Sneh, et al.	118	723 R	12/17/1999	
	A114	6,306,216	10/23/2001	Kim, et al.	118	725	07/12/2000	
	A115	6,316,098	11/13/2001	Yitzchaik, et al.	428	339	03/23/1999	
	A116	2001/0000866	05/10/2001	Sneh, et al.	118	723 R	11/29/2000	
✓	A117	2001/0009140	07/26/2001	Bondestam, et al.	118	725	01/25/2001	
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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
u	B31	04-031396 A	02/03/1992	JP	C30B	25/14	—	X
	B32	06-291048	10/18/1994	JP	H01L	21/205	—	X
	B33	08-264530	10/11/1996	JP	H01L	21/3205	—	X
✓	B34	11-269652	10/05/1999	JP	C23C	16/44	—	X
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*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.						
u	C16	Lee, "The Preparation of Titanium-Based Thin Film by CVD Using Titanium Chlorides as Precursors", <i>Chemical Vapor Deposition</i> , 5(2) (Mar. 1999), pp. 69-73.						
u	C17	Martensson, et al., "Atomic Layer Epitaxy of Copper, Growth & Selectivity in the Cu (II)-2,2,6,6-Tetramethyl-3, 5-Heptanedion ATE/H <sub>2</sub> Process", <i>J. Electrochem. Soc.</i> , 145(8) (Aug. 1998), pp. 2926-2931.						
Examiner KAPLA MOORE					Date Considered 3/9/05			
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me	A118	2001/0011526	08/09/2001	Doering, et al.	118	729	01/16/2001
me	A119	2001/0031562	10/18/2001	Raaijmakers, et al.	438	770	02/22/2001
	A120	2001/0034123	10/25/2001	Jeon, et al.	438	643	04/06/2001
	A121						
	A122						
	A123						

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*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation	
							YES	NO
me	B35	2001-62244	03/13/2001	JP	B01D	53/34	—	X
	B36	198 20 147	07/01/1999	DE	H01L	21/3205	—	X
	B37	196 27 017	01/09/1997	DE	H01L	21/283	—	X
	B38	2 626 110	07/21/1989	FR	H01L	39/24	—	X
	B39	2 692 597	12/24/1993	FR	C23C	16/00	—	X
↓	B40	2 355 727A	05/02/12001	GB	C23C	16/44	—	X

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*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.
me	C18	Min, et al., "Chemical Vapor Deposition of Ti-Si-N Films with Alternating Source Supply", <i>Mat., Res. Soc. Symp. Proc.</i> , Vol. 564 (Apr. 5, 1999), pp. 207-210
	C19	Bedair, "Atomic layer epitaxy deposition processes", <i>J. Vac. Sci. Technol.</i> 12(1) (Jan/Feb 1994)
	C20	Yamaga, et al., "Atomic layer epitaxy of ZnS by a new gas supplying system in a low-pressure metalorganic vapor phase epitaxy", <i>J. of Crystal Growth</i> 117 (1992), pp. 152-155
↓	C21	Elam, et al., "Nucleation and growth during tungsten atomic layer deposition on SiO <sub>2</sub> surfaces," <i>Thin Solid Films</i> 386 (2001) Pages 41 – 52, (Accepted Dec. 14, 2000).

Examiner	KAPLA MOUPE	Date Considered	3/9/05
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# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1

of 1

Application Number

10/032,284

Filing Date

December 21, 2001

First Named Inventor

Ling Chen et al.

Group Art Unit

1763

Examiner Name

Moore, Karla A.

Attorney Docket Number

AMAT/5192.02/CPI/COPPER/PJS

Submission Date

March 31, 2004

## **U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
K ↓	A1	US-3,291,456	12-13-1966	Deane	
	A2	US-4,761,269	08-02-1988	Conger et al.	
	A3	US-6,302,965 B1	10-16-2001	Umotoy et al.	
	A4	US-2003/0019428 A1	01-30-2003	Ku et al.	
	A5	US-			
	A6	US-			
	A7	US-			
	A8	US-			
	A9	US-			
	A10	US-			
	A11	US-			
	A12	US-			
	A13	US-			
	A14	US-			
	A15	US-			
	A16	US-			
	A17	US-			
	A18	US-			

## **FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
	B1					
	B2					
	B3					
	B4					
	B5					

Examiner

KAPLA MOORE

Date Considered

3/9/05

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# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Application Number	10/032,284
Filing Date	December 21, 2001
First Named Inventor	Ling Chen et al.
Group Art Unit	1763
Examiner Name	Karla A. Moore
Attorney Docket Number	APPM/5192.02/CP/COPPER/PJS
Submission Date	April 23, 2004

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		Number-Kind Code <sup>2</sup> (if known)			
Kee	A1	US-4,058,430	11-15-1977	Suntola et al.	
	A2	US-4,389,973	06-28-1983	Suntola et al.	
	A3	US-4,413,022	11-01-1983	Suntola et al.	
	A4	US-4,834,831	05-30-1989	Nishizawa et al.	
	A5	US-4,975,252	12-04-1990	Nishizawa et al.	
	A6	US-4,993,357	02-19-1991	Scholz	
	A7	US-5,225,366	07-06-1993	Yoder	
	A8	US-5,281,274	01-25-1994	Yoder	
	A9	US-5,281,485	01-25-1994	Colgan et al.	
	A10	US-5,294,286	03-15-1994	Nishizawa et al.	
	A11	US-5,306,666	04-26-1994	Izumi	
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Kee	B1	GB 2 355 727 A	05-02-2001	Kim et al.		
	B2	JP 08-264530 (Abstract)	10-11-1996	Haruhito et al.		
	B3	JP 2000-212752	11-12-2002	Chae et al.		X
	B4	JP 2001-172767	06-26-2001	Mikko et al.		X
	B5	JP 2001-328900	11-27-2001	Akinosuke		X

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Application Number	10/032,284
Filing Date	December 21, 2001
First Named Inventor	Ling Chen et al.
Group Art Unit	1763
Examiner Name	Karla A. Moore
Attorney Docket Number	APPM/5192.02/CPI/COPPER/PJS
Submission Date	April 23, 2004

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		Number-Kind Code <sup>2</sup> (if known)			
ku	A19	US-5,730,802	03-24-1998	Ishizumi, et al.	
	A20	US-5,804,488	09-08-1998	Shih et al.	
	A21	US-5,807,792	09-15-1998	Ilg, et al.	
	A22	US-5,838,677	11-17-1998	Kozaki et al	
	A23	US-5,855,680	01-05-1999	Soininen et al.	
	A24	US-5,879,459	03-09-1999	Gadgili, et al.	
	A25	US-5,916,365	06-29-1999	Sherman	
	A26	US-5,923,056	07-13-1999	Lee, et al.	
	A27	US-6,015,590	01-18-2000	Suntola et al.	
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	A30	US-6,066,358	05-23-2000	Guo et al.	
	A31	US-6,124,158	09-26-2000	Dautartas, et al.	
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	A33	US-6,174,377 B1	01-16-2001	Doering, et al.	
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	A35	US-6,200,893 B1	03-13-2001	Sneh	
	A36	US-6,203,613 B1	03-20-2001	Gates et al.	

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		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
ku	B6	WO 00-16377	03-23-2000	Yi et al.		
	B7	WO 01-17692 A1	03-15-2001	Raaijmakers		
	B8	WO 01-27346 A1	04-19-2001	Elers		
	B9	WO 01-27347 A1	04-19-2001	Elers		
	B10	WO 01-29280 A1	04-26-2001	Elers et al.		

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Date Considered

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STATEMENT BY APPLICANT

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Sheet 3

of 9

Application Number	10/032,284
Filing Date	December 21, 2001
First Named Inventor	Ling Chen et al.
Group Art Unit	1763
Examiner Name	Karla A. Moore
Attorney Docket Number	APPM/5192.02/CPI/COPPER/PJS
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		Number-Kind Code <sup>2</sup> (if known)			
ku	A37	US-6,207,487 B1	03-27-2001	Kim et al.	
	A38	US-6,218,298 B1	04-17-2001	Holnkis	
	A39	US-6,284,646 B1	09-04-2001	Leem	
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	A43	US-6,333,260 B1	12-25-2001	Kwon, et al.	
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		Country Code <sup>2</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
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	B15	WO 02-08485 A2	01-31-2002	Van Wijck et al.		

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Sheet

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9

Application Number	10/032,284
Filing Date	December 21, 2001
First Named Inventor	Ling Chen et al.
Group Art Unit	1763
Examiner Name	Karla A. Moore
Attorney Docket Number	APPM/5192.02/CPV/COPPER/PJS
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		Number-Kind Code <sup>2</sup> (if known)			
KLM	A55	US-6,416,577 B1	07-09-2002	Suntolca et al.	
	A56	US-6,416,822 B1	07-09-2002	Chiang et al.	
	A57	US-6,420,189 B1	07-16-2002	Lopatin	
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	A68	US-6,482,740 B2	11-19-2002	Soininen, et al.	
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KLM	B16	WO 02-43115 A2	05-30-2002	Pomarede et al.		
	B17	WO 02-45167 A2	06-06-2002	Hujanen et al.		
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	B19					
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<i>KM</i>	A73	US-6,599,572 B2	07-29-2003	Saania et al.	
	A74	US-6,607,976 B2	08-19-2003	Chen et al.	
	A75	US-6,632,279 B1	10-14-2003	Ritala et al.	
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 6

of 9

Application Number	10/032,284
Filing Date	December 21, 2001
First Named Inventor	Ling Chen et al.
Group Art Unit	1763
Examiner Name	Karla A. Moore
Attorney Docket Number	APPM/5192.02/CPI/COPPER/PJS
Submission Date	April 23, 2004

## U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
	A91	US-2002-0019121 A1	02-14-2002	Pyo	
	A92	US-2002-0020869 A1	02-21-2002	Park et al.	
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		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
	B26					
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Examiner

KARLA MOORE

Date Considered

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Application Number

10/032,284

Filing Date

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First Named Inventor

Ling Chen et al.

Group Art Unit

1763

Examiner Name

Karta A. Moore

Attorney Docket Number

APPM/5192.02/CP/COPPER/PJS

Submission Date

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	A121	US-			
	A122	US-			
	A123	US-			
	A124	US-			
	A125	US-			
	A126	US-			

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LAPLA MOORE

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet

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Application Number

10/032,284

Filing Date

December 21, 2001

First Named Inventor

Ling Chen et al.

Group Art Unit

1763

Examiner Name

Karla A. Moore

Attorney Docket Number

APPM/5192.02/CPI/COPPER/PJS

Submission Date

April 23, 2004

**NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>2</sup>
Ku	1	Kukli, et al. "Properties of $\{Nb_{1-x}Ta_x\}_2O_5$ Solid Solutions and $\{Nb_{1-x}Ta_x\}_2O_5$ - $ZrO_2$ Nanolaminates Grown by Atomic Layer Epitaxy," NanoStructured Materials, Vol. 8, No. 7, 1997, p. 785-93	—
	2	Kukli, et al., "In-situ Study of Atomic Layer Epitaxy Growth of Tantalum Oxide Thin Films from $Ta(OC_2H_5)_5$ and $H_2O$ ," Applied Surface Science, March 1997, p. 236-42	—
	3	Kukli, et al. "Properties of $Ta_2O_3$ based Dielectric Nanolaminates Deposited by Atomic Layer Epitaxy," J. Electrochem. Soc., Vol. 144, No. 1 January 1997, p. 300-306	—
	4	Kukli, et al. "Tailoring the Dielectric Properties of $HfO_2$ - $Ta_2O_5$ Nanolaminates," Appl. Phys. Lett. 68 (26), June 24, 1996, p. 3737-3739	—
	5	Kukli, et al. "Atomic Layer Epitaxy Growth of Tantalum Oxide Thin Films from $Ta(OC_2H_5)_5$ and $H_2O$ ," J. Electrochem. Soc., Vol. 142, No. 5, May 1995 p. 1670-1675	—
	6	Ritala, M., et al. "Controlled growth of $TaN$ , $Ta_3N_5$ , and $TaO_xN_y$ thin films by atomic layer deposition," Chem. Mater., Vol. 11, No. 7, 1999 pp. 1712-1718	—
	7	Leskela, M., et al. "Atomic layer epitaxy in deposition of various oxide and nitride thin films," Colloque C5, supplement au Journal de Physique II, Volume 5, June 1995 pp.937-951	—
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Examiner

KARLA MOORE

Date Considered

3/9/05

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Group Art Unit	1763
Examiner Name	Karla A. Moore
Attorney Docket Number	APPM/5192.02/CPI/COPPER/PJS
Submission Date	April 27, 2004

Sheet 11 of 1

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KLM	A1	US-5,796,116	08-18-1998	Nakata et al.	
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	A3	US-			
	A4	US-			
	A5	US-			
	A6	US-			
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		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
KLM	B1	WO 99/29924	06-17-1999	Suntola et al.		
	B2	WO 01/12891 A1	02-22-2001	Park		
	B3					
	B4					
	B5					

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KARLA MOORE

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